First Circum-Pacific Record of *Dimorphinites* (Ammonoidea, Upper Bajocian) in the Precordillera of Northern Chile

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New ammonite fossil-assemblages containing morphoceratids have been discovered in the Quebrada San Pedro area, northern Chile, Region de Antofagasta, Comuna Sierra Gorda, approximately 40 km ESE of Sierra Gorda town and 75 km south of Calama city. The outcrop is located 1 km north of the composite section described as Quebrada de San Pedro and 10 km south of the classical localities of Caracoles Mining District previously studied by diverse authors (Gottsche, 1878; Steinmann, 1881; Möricke, 1894; Westermann, 1967, 1981; Hillebrandt, 1970, 1973, 1977, 2001; Westermann and Riccardi, 1979, 1980; Jensen and Quinzio, 1979, 1981; Gröschke and Hillebrandt, 1985; Hillebrandt et al., 1986; Gröschke et al., 1988; Riccardi et al., 1990a, b; Riccardi and Westermann, 1991a,b; Fernandez-Lopez et al., 1994; Gröschke and Hillebrandt, 1994).

In the Caracoles-Quebrada de San Pedro area, overlying unconformably Triassic volcanic and metamorphic rocks, there is a succession of Jurassic, fossiliferous deposits belonging to the Caracoles Group (Harrington, 1961; Garcia, 1967; Montaño, 1976; Marinovic and Garcia, 1999; Ardill et al., 1998). The lowest marine deposits are brown, calcareous sandstones and fine-grained conglomerates belonging to the Coronado Formation. This lithostratigraphic unit is followed by yellow and brown shales with intercalations of limestones and calcareous sandstones, of the Torcazas Formation, developed in shallow marine settings. In overlying levels, there are yellow and green shales with intercalations of limestones, belonging to the Mina Chica Formation, developed in offshore settings. The lithostratigraphic position of the new ammonite fossil-assemblages is the top of the Torcazas Formation, below the Mina Chica Formation. In this locality, the last beds of the Torcazas Formation correspond to a centimetric interval of grey wackestone to packstone limestones containing resedimented specimens of Upper Bajocian ammonites, without traces of reelaboration. These ammonites have been collected by one of the authors (F.L.) during several field studies, between 2006 and 2010.

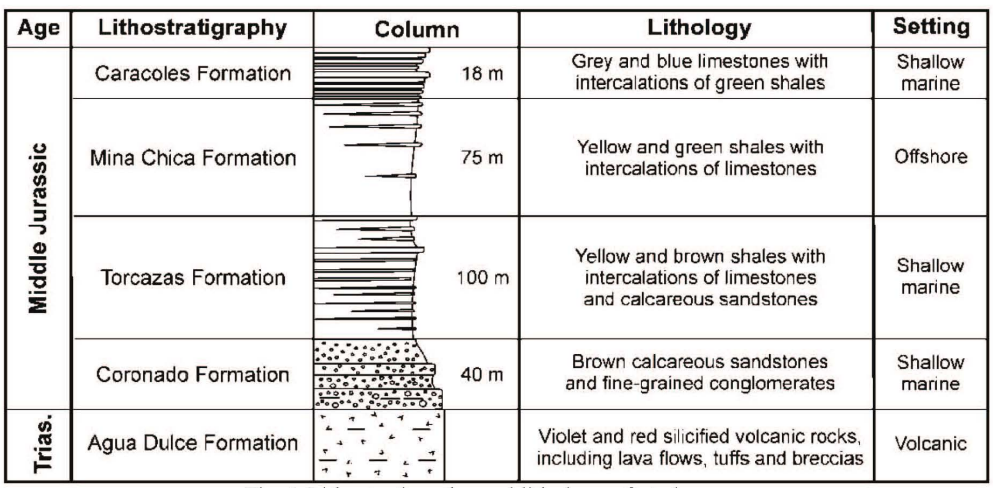

Fig. 1 Lithostratigraphy and lithology of study area

Among the ammonoids of these fossil- assemblages, Sphaeroceratidae are dominant, being *Megasphaeroceras* [M+m] the most common ammonite genus. Stephanoceratidae, Perisphinctidae and Oppeliidae are scarce, but *Cadomites* [M]-*Polyplectites* [m], *Vermisphinctes* [m]-*Prorsisphinctes* [M] and *Oxycerites* [M]-*Paroecotraustes* [m] are well represented. Morphoceratidae, Lissoceratidae and Strigoceratidae are very scarce, respectively represented by *Dimorphinites* [M]-*Vigoriceras* [m], *Lissoceras* [M]-*Microlissoceras* [m] and *Strigoceras* [M]. Besides Ammonitina, Phylloceratina and Lytoceratina are extremely scarce, but they occur. Among the morphoceratids of this stratigraphical interval, macroconchs of *Dimorphinites dimorphus* (D'Orbigny) and microconchs of *Vigoriceras defrancii* (D'Orbigny) have been identified. Since *Dimorphinites dimorphus* (D'Orbigny) [M+m] has only been known from the

Parkinsoni Zone, Upper Bajocian, of Europe, North Africa and south part of the Transcaucasus (cf. Dietze and Bernt, 2009), this standard zone is now extended to the SE Pacific. Some associated taxa, such as *Vermisphinctes* [m]-*Prorsisphinctes* [M], *Strigoceras* [M] and *Oxycerites* [M]-*Paroecotraustes* [m] also indicate the uppermost Bajocian age and Tethyan affinities.

Key words: Jurassic; Marine stratigraphy; Palaeobiogeography; South America

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